

## **REMARKS**

### ***Status of the Claims***

Upon entry of the present amendment, claims 1, 3, 5 and 7-16 remain pending in the above-identified application, with claims 1, 3, 5 and 14-15 standing ready for further action on the merits, and remaining claims 7-13 and 16 being withdrawn from consideration based on an earlier restriction requirement of the Examiner. Claims 1, 14 and 15 have been amended by deleting the phrase "said silica-containing laminated structure having a minimum reflectance of from 0.1 to 0.45%."

Accordingly, the present amendments to the claims do not introduce new matter into the application as originally filed. As such entry of the instant amendment and favorable action on the merits is earnestly solicited at present.

### ***Election/Restrictions***

Claim 16 is withdrawn by the Examiner since it relates to nonelected species A(b).

### ***Rejections Based on Prior Art***

Claims 1, 3, 5, 14 and 15 are rejected under **35 U.S.C. § 103(a)** as being unpatentable for obviousness over **Lange et al.** (US 4,816,333) in view of **Takahashi et al.** (US 6,251,523).

More specifically, in the Office Action dated June 4, 2009, the USPTO maintains the rejections of claims 1, 3, 5, 14 and 15 under U.S.C. 103(a) as being obvious over **Lange** in view of **Takahashi**. The USPTO takes a position that **Takahashi** teaches the use of moniliform silica strings for forming a porous silica layer exhibiting excellent optical performance on a glass substrate, and that **Takahashi** also teaches the formation of such a porous silica layer by drying at a temperature in the range of room temperature to 200 °C for 1 minute to 2 hours and, hence,

is combinable with **Lange** which describes the use of a polymer substrate, so that the present invention is obvious over the combination of **Lange** and **Takahashi**.

Reconsideration and withdraw of the instant rejection is respectfully requested based on the following considerations.

*Legal Standard for Determining Prima Facie Obviousness*

M.P.E.P. § 2141 sets forth the guidelines in determining obviousness. First, the Examiner has to take into account the factual inquiries set forth in *Graham v. John Deere*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), which has provided the controlling framework for an obviousness analysis. The four *Graham* factors are:

- (a) determining the scope and content of the prior art;
- (b) ascertaining the differences between the prior art and the claims in issue;
- (c) resolving the level of ordinary skill in the pertinent art; and
- (d) evaluating any evidence of secondary considerations.

*Graham v. John Deere*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966).

Second, the Examiner has to provide some rationale for determining obviousness. MPEP § 2143 sets forth some rationales that were established in the recent decision of *KSR International Co. v Teleflex Inc.*, 82 USPQ2d 1385 (U.S. 2007). Exemplary rationales that may support a conclusion of obviousness include:

- (a) *combining prior art elements according to known methods to yield predictable results;*
- (b) *simple substitution of one known element for another to obtain predictable results;*

- (c) *use of known technique to improve similar devices (methods, or products) in the same way;*
- (d) *applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;*
- (e) *“obvious to try” – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success*
- (f) *known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art;*
- (g) *some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.*

As the M.P.E.P. directs, all claim limitations must be considered in view of the cited prior art in order to establish a *prima facie* case of obviousness. See M.P.E.P. § 2143.03.

*Distinctions over the Cited Art*

In the present invention, the presence of large pores (P) (having a pore opening area larger than the average value of the respective maximum cross-sectional areas of the primary silica particles) and the specific total value of large pore opening areas ( $a_1$ ) (at least  $3\sigma$  larger than average value ( $a_2$ )) represented by formula (1) in claim 1 are essential for simultaneously achieving excellent optical properties and strength. (These features are hereinafter, collectively referred to as “specific large pore characteristics”.) On the other hand, **Takahashi** has no teaching or suggestion about such a specific large pore characteristics and, let alone, the excellent effects achieved thereby. In fact, in the Examples of **Takahashi**, the silica coating

formed does not satisfy the formula (1) recited in claim 1 of the present application. In order to substantiate this, Mr. Ioka who is one of the Applicants of the present application has made observations on the difference in porous structure between the porous silica layer of the laminated structure of the present invention and the porous silica layer of the laminated structure according to **Takahashi**, and the influence of the difference in porous structure on the optical properties of the laminated structures, referring to Example 21 and Comparative Example 6 of the present application. The observations are as described in **Exhibit 1** of the accompanying **37 CFR § 1.132 Declaration of Mr. Takaaki Ioka**. The content of Mr. Ioka's Declaration is briefly explained below.

*37 CFR § 1.132 Declaration of Mr. Takaaki Ioka*

As stated in **Exhibit 1** of Mr. Ioka's Declaration, Example 21 and Comparative Example 6 of the present application are the same except that the substrates used in Example 21 and Comparative Example 6 are different, and that the coating composition on the substrate was subjected to "drying at 120 °C for 2 minutes using a forced convection oven" in Example 6, whereas the coating composition on the substrate was "dried at 120 °C for 2 minutes using a forced convection oven, followed by heating using a muffle furnace at 250 °C for 30 minutes, and then at 500 °C for 1 hour" in Comparative Example 6. That is, Comparative Example 6 corresponds to the Examples of **Takahashi** where the coating composition is heated at a temperature of 500 °C or higher, namely "500 °C for 1 hour" (col. 8, lines 47 to 52 etc.) except for the "Second Embodiment" in which heating was done "for 15 minutes at 570 °C" (col. 11, lines 20 to 25). As already pointed out in the previous response, such a high temperature heating

is done in **Takahashi** for securing the strength of the porous silica layer (col. 7, lines 31 to 34 of **Takahashi**).

With respect to the porous silica layers formed in Example 21 and Comparative Example 6, photomicrographs of the surfaces of the porous silica layers and graphs showing the distributions of pore opening areas obtained from image analyses of the photomicrographs are shown in Fig. 5' and Fig. 7' of **Exhibit 1** of Mr. Ioka's Declaration.

Referring to Fig. 7', Mr. Ioka points out that the porous silica layer formed in Comparative Example 6 has "a large number of gaps of 5 to 20 nm width" as described at col. 2, lines 20 to 23 of **Takahashi**; nevertheless, the specific large pore characteristics are not satisfied in Comparative Example 6.

The results of Example 21 and Comparative Example 6 are summarized in **Table A** of **Exhibit 1** of Mr. Ioka's Declaration, which is reproduced below for easy reference.

**Table A**

	Total ratio (S) of pore opening areas of all pores	Total ratio ( $S_{(a_2+3\sigma)}$ ) of pore opening areas of pores each having a pore opening area which is $(a_2 + 3\sigma)$ or more	$(S_{(a_2+3\sigma)})/(S)$	Minimum reflectance	Haze
Claim 1	-	-	$\geq 0.5$		
Ex. 21	20.08 %	13.73 %	0.68	0.05 %	0.5 %
Comp. Ex. 6	11.93 %	4.87 %	0.41	0.45 %	0.4 %

From the observations, Mr. Ioka concludes:

(1) that, it is apparent that, in Example 21 (present invention) where the porous silica layer is formed by drying the coating composition containing moniliform silica strings at 120 °C for 2 minutes, the resultant laminated structure satisfies the specific large pore characteristics

defined in claim 1 of the present application, and exhibits an advantageously low reflectance (0.05 %) without scarifying the strength of the porous silica layer;

(2) that, on the other hand, in Comparative Example 6 of the present application (corresponding to **Takahashi**) where the porous silica layer is formed by heating the same coating composition as used in Example 21 at 500 °C for 1 hour, the resultant laminated structure does not satisfy the specific large pore characteristics as defined in claim 1 of the present application, and exhibits a high reflectance (0.45 % which is almost 10 times higher than that in Example 21); and

(3) that, from items (1) and (2) above, it is apparent that the specific pore characteristics as defined in claim 1 of the present application are essential for achieving a very low reflectance without scarifying the strength of the porous silica layer, and that such specific large pore characteristics cannot be achieved when the coating composition containing moniliform silica strings is heated at a very high temperature (such as 500 °C) as in the Examples of **Takahashi**.

In addition to the above observations of Mr. Ioka, the following is also noted.

The USPTO points out that **Takahashi** teaches the formation of a porous silica film by drying at a temperature in the range of room temperature to 200 °C for 1 minute to 2 hours. However, what is taught by **Takahashi** is only that that the porous silica layer may be formed by drying at a temperature in the range of from room temperature to 200 °C but the strength of the porous silica layer cannot be secured unless further heated at a very high temperature (400 to 750 °C). In other words, **Takahashi** by no means teaches or suggests that any advantage will be obtained when the heating at high temperature is omitted. In fact, in all of the Examples of

**Takahashi**, the heating at a temperature of 500 °C or higher is conducted. Thus, as long as the omission of the high temperature heating is concerned, all that is suggested by **Takahashi** is the lowering of the strength of the porous silica layer. In this situation, those skilled in the art may consider the possibility of combining **Lange** with **Takahashi**, but that would be without “reasonable expectation of success”.

Furthermore, **Takahashi** has no teaching or suggestion about the specific large pore characteristics defined in claim 1 of the present invention, and Mr. Ioka’s Declaration clearly shows the unexpected results (especially, the very low reflectance which is lower than 1/10 of that of **Takahashi**)) achieved by the specific large pore characteristics.

Therefore, it is apparent that the laminated structure of the present application is not obvious over **Lange** in view of **Takahashi**.

*Additional Comments*

For completeness, it is noted that the *MPEP* at § 2145 clearly sets forth that rebuttal evidence and arguments can be presented in the specification, *In re Soni*, 54 F.3d 746, 750, 34 USPQ2d 1684, 1687 (Fed. Cir. 1995), by counsel, *In re Chu*, 66 F.3d 292, 299, 36 USPQ2d 1089, 1094-95 (Fed. Cir. 1995), or by way of an affidavit or declaration under 37 CFR 1.132, e.g., *Soni*, 54 F.3d at 750, 34 USPQ2d at 1687; *In re Piasecki*, 745 F.2d 1468, 1474, 223 USPQ 785, 789-90 (Fed. Cir. 1984). That USPTO office personnel should consider all rebuttal arguments and evidence presented by applicants. A determination under 35 USC § 103 should rest on all the evidence and should not be influenced by any earlier conclusion. See, e.g., *Piasecki*, 745 F.2d at 1472-73, 223 USPQ at 788; *In re Eli Lilly & Co.*, 902 F.2d 943, 945, 14 USPQ2d 1741, 1743 (Fed. Cir. 1990). Thus, once the applicant has presented rebuttal evidence,

USPTO office personnel should reconsider any initial obviousness determination in view of the entire record. Office personnel should not evaluate rebuttal evidence for its “knockdown” value against the *prima facie* case, *Piasecki*, 745 F.2d at 1473, 223 USPQ at 788, or summarily dismiss it as not compelling or insufficient. If the evidence is deemed insufficient to rebut the *prima facie* case of obviousness, USPTO office personnel should specifically set forth the facts and reasoning that justify this conclusion.

### **CONCLUSION**

Based upon the amendments and remarks presented herein as well as the enclosed 37 CFR § 1.132 Declaration of Mr. Ioka, the Examiner is respectfully requested to issue a Notice of Allowance clearly indicating that each of the pending claims 1, 3, 5 and 14-15 is allowable under the provisions of Title 35 of the United States Code.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact John W. Bailey, Reg. No. 32,881 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.



If necessary, the Director is hereby authorized in this, concurrent, and future replies to charge any fees required during the pendency of the above-identified application or credit any overpayment to Deposit Account No. 02-2448.

Dated: December 3, 2009

Respectfully submitted,

By 

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Attachments: 37 C.F.R. § 1.132 Declaration of Mr. Takaaki Ioka with Exhibit 1 (13 pages).